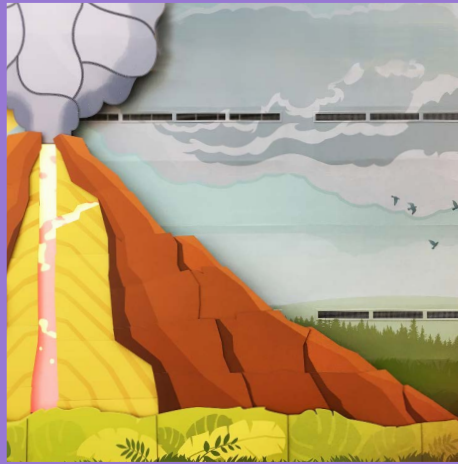


CONNECTICUT SCIENCE CENTER



EXPLORATION GUIDE

2017-2018



CTScienceCenter.org
250 Columbus Blvd.
Hartford, CT 06103

Connecticut
Science Center



WEATHER: UNPREDICTABLE AND EXTREME

Objectives

- Students will investigate the unpredictability of weather systems and construction an explanation for why this is so.
- Students will explore and model the large-scale factors that lead to the formation of hurricanes.
- Students will examine the relationship between the temperature and density of air and how it relates to weather patterns.
- Students will investigate and utilize meteorological tools.

Overview:

Getting Started: This discussion could occur in the classroom, or on the bus ride, when preparing students for the field trip.

Introduction: Try to think of some ways the weather here in Connecticut could be related to weather on the other side of the globe. Weather patterns are caused by systems of air and water that cover the globe and interact with each other. These systems create the weather you might find on a mild day as well as massive storms such as hurricanes.

As we go through the museum today, be on the look out for:

Focus Questions:

- What is the relationship between temperature, air, and weather?
- What makes weather hard to predict?
- How do big storms such as hurricanes form?
- What are some weather patterns that can be harnessed by humans?



HINT: These are great questions to use while exploring the galleries to with your group to help them think about weather.

Visit Debrief:

On the bus ride home, or back in your classroom, ask your students to reflect on what they learned:

- How does the heat from the sun drive weather patterns?
- How do low and high-pressure systems interact? What happens because of the interaction between high and low-pressure systems?
- Can you explain the movement of the clouds?
- What tools do you think are most helpful for predicting the weather?

Concept Summary

- Weather that can be observed is part of larger patterns that cover the globe.
- The heat from the sun drives cycling of air, which in turn drives our weather patterns.
- Weather patterns are measured using various tools and these measurements are used to predict future conditions.
- Dangerous storms form when the conditions that drive our weather patterns become extreme.

Next Generation Science Standards

SCIENCE AND ENGINEERING PRACTICE

Planning and Carrying Out Investigations

Analyzing and Interpreting Data

Constructing Explanations and Designing Solutions

Engaging in Arguments from Evidence

DISCIPLINARY CORE IDEAS:

ESS2.C: The Roles of Water in Earth's Surface Processes

ESS2.D: Weather and Climate

ESS3.B: Natural Hazards

ESS3.D: Global Climate Change

CROSSCUTTING CONCEPTS:

Patterns

Cause and Effect

STUDENT GUIDE:

EXPLORATION GUIDE: STUDENTS
GRADE LEVEL 6-8

CONNECTICUT
SCIENCE CENTER

NAME: _____

Activity Station: Hot Air Balloon
Level 4, Bridge between Galleries



EXPLAIN what causes the hot air balloon to rise or drop.



DESCRIBE how the change in air temperature here relates to bigger weather patterns.

PAGE 1 OF 5



GETTING STARTED:

Chaperones, these activities can be done in any order as you move through the galleries.



HINT:

Warmer air is less dense (lighter) than cooler air, so it rises. When the air inside the balloon is heated, it causes the entire balloon to rise.



HINT:

Warm air rising pushes cooler air down and causes big cycles of moving air in our atmosphere. These cycles drive our weather patterns.

STUDENT GUIDE:

EXPLORATION GUIDE: STUDENTS
GRADE LEVEL 6-8

CONNECTICUT
SCIENCE CENTER

NAME: _____

Activity Station: Weather over Time
Level 5, Exploring Space Gallery



DRAW a model that shows how a hurricane forms.



SELECT Hurricane Katrina on the monitor. Trace the path of the hurricane. Where do you think the high and low pressure regions are?



WATCH the movement of the clouds. What causes them to move?

PAGE 2 OF 5



HINT: Hurricanes form when warm air rises off the surface of warm water and the change in pressure causes the air to spin.

STUDENT GUIDE:

EXPLORATION GUIDE: STUDENTS
GRADE LEVEL 6-8

CONNECTICUT
SCIENCE CENTER

NAME: _____

Activity Station: Mission on Mars
Level 5, Exploring Space Gallery



LOOK at the monitor above the exhibit. What are the current weather conditions on Mars? Explain why humans could or could not survive in those conditions.



HOW do the seasons on Mars differ from ours on Earth?



DESIGN a suit that would help astronauts survive the weather on Mars. What would the suit need to have?



HINT: Mars does have distinct seasons like on Earth. However, the Martian Year is almost twice the length of a year on Earth so the seasons on Mars are longer. A year on Mars is 687 Earth days. Mar's axis is also slightly more tilted than Earth's.

STUDENT GUIDE:

EXPLORATION GUIDE: STUDENTS
GRADE LEVEL 6-8

CONNECTICUT
SCIENCE CENTER

NAME: _____

Activity Station: Hurricane Simulator
Level 6, Planet Earth Gallery



DESCRIBE how a hurricane forms.



DESCRIBE the eye of the storm in your own words. What is different about it from the rest of the storm?



Try the hurricane simulator. PREDICT what type of damage a hurricane this strong might cause in a neighborhood. What would you propose to protect communities in a hurricane?



HINT: The eye is the calm area in the middle of a hurricane. It is a smaller area with almost no wind or rain. It is an area of low pressure as well.


STUDENT GUIDE:


EXPLORATION GUIDE: STUDENTS
GRADE LEVEL 6-8


CONNECTICUT
SCIENCE CENTER

NAME: _____

Activity Station: Explore the Weather Station
Level 6, River of Life Gallery

 EXPLAIN why forecasting the weather is difficult and why weather predictions are occasionally wrong.

 PLAN a weather forecast based on today's forecast. Then DELIVER your forecast in front of the green screen.



PAGE 5 OF 5



HINT: There are so many big factors that affect our weather and the tiniest shift in any factor can have major effects. Even a change in the amount of paving or trees in an area can affect the weather.



DON'T FORGET: Input an email address so you can see the students' forecasts later!

WEATHER: UNPREDICTABLE AND EXTREME

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TRIP TIP: Give your students some free exploration time when entering a new gallery area. This will help them concentrate when you invite them to focus on a specific exhibit or a question later.

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EXPLORATION GUIDE: STUDENTS
GRADE LEVEL 6-8

CONNECTICUT
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SCIENCE CENTER

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Level 5, Exploring Space Gallery



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..... NAME: _____

WEATHER: UNPREDICTABLE AND EXTREME

Weather can change quickly and unexpectedly, seem steady and reliable, or be slow to change. Some weather patterns can be cause for concern or even life threatening, such as a hurricane causing unsafe road conditions and flooding or a lengthy drought destroying crops and leaving people without a water. In these cases, being able to predict weather and adjust to it is not only important for comfort, but for survival as well.

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